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ABSTRACT

Although many composition teachers have taken to heart recent studies on the mind-brain (humanities/science) link and have begun to anticipate enhancing the teaching profession by providing a solid link between teachers of writing and "hard" scientists, such links between minds and brains should not become part of pedagogical design. Textbooks and teaching manuals that provide composition teachers with right brain/left brain exercises, or ideas on training eye movements are appearing, but brain hemisphericity studies are not as clear-cut as these texts would have teachers believe. Reasons for waiting to use mind-brain research to revise pedagogical literature include the following: (1) instructional programs derived from neurological studies ignore the peculiar experimental conditions necessary to produce the anomalous behaviors reported in the literature; (2) more recent cerebral hemisphere studies do not allow for axiomatic conclusions, because recent findings reveal functions like language are not solely based in one hemisphere; (3) classroom teachers who wish to teach individual students on the basis of hemispheric dominance really cannot do so, because no classroom is equipped to determine how an individual's brain is organized; and (4) the body of knowledge about intra-brain specialization for language production cannot be translated directly to writing, an equally complex but different type of performance. (A list of works cited and works consulted is appended.) (SKC)

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Minds, Brains, and the Language Arts: A Cautionary Note.

Accepting the 1981 Nobel Prize in Medicine for his work in neurosurgery, Roger Sperry announced, "The whole world of inner experience (the world of the humanities), long rejected by 20th-century scientific materialism, thus becomes recognized and included within the domain of science" ("Some Effects" 1226). Despite the radical hegemony of Sperry's remarks, many of us who have long reckoned with the intransitivity of inner experience, and especially its written expression, have anticipated a general link between composition and science and a specific link between minds and brains. Our anticipation has been reasonably based on a notion that training minds has something to do with changing brains. So, Sperry's views about minds being somehow linked to brains are altogether congenial and, indeed, often taken to enhance our profession by securing a prestigious collegiality between composition teachers and neurosurgeons.[1] However, we will argue that the links between minds and brains, so far and in the foreseeable future, are not appreciable elements of a pedagogical design. Our argument, in some important ways, is an extension of the very issues which underly the appeal of a mind and brain link, namely, that writing is an especially complicated skill.

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Our argument is motivated in part by a burgeoning body of pedagogical literature which, on the basis of a mind and brain link, draws upon the

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divided anatomy and functioning of the human brain. For example:

(1) A 1982 manual for elementary school teachers prescribes methods, e.g., eye movement exercises, for deciding the dominant hemisphere of individual students. The manual goes on to predict that children decided to possess a dominant right-brain will often be poorer in reading and superior in athletics (Vitale 19). The manual also suggests that teachers sometimes may wrongly accuse "right-brain children" of cheating since they allegedly answer questions holistically rather than via sequentially retrievable stages (Vitale 13).

(2) A 1983 college writing text would have its clientele turn off its analytical "sign" mind in favor of the often suppressed "design" mind, since the former is held to retard certain preferred writing strategies, e.g., clustering (Rico 17-19, 39-40).

(3) A 1982 guide purports to assist individuals in expanding the use of their brains, arguing that individuals can speak directly to their brains as sort of removed agents (Houston 60). The guide, which includes left brain and right brain exercises akin to cognitive calisthenics, also suggests that dyslexic children might compensate for their condition by applying "a magic wand" to the mental image of the misperceived letter (Houston 70-71).

Perhaps coincidentally or shewdly, the usual upshot of composition

pedagogies founded on bilateral hemispheric division often seem to constitute little more than renamed versions of the standard distinctions between the concrete and abstract, linear and holistic, sequential and random, and so forth. In the sense that we teachers have regularly coerced our students to be at once grammatical and inventive, and have directed our instruction accordingly, the appeal of the brain-based pedagogies may lie more in equipping usual teaching methods with a scientific nomenclature than in presenting genuine innovations. Moreover, manuals and texts which exploit a mind-brain link to mandate various instructional strategies offer nominal disclaimers acknowledging the recency and tenuousness of brain lateralization research (e. g., Vitale 17, 19). Unfortunately, such disclaimers seem not to weaken the substantive claims. More significantly, the disclaimers do nothing to moderate expectations about the future relevance of neurological research to writing instruction.

Given more or less compelling motivations for linking minds to brains, these texts rely on an established body of prima facie evidence. In the first place, the anatomy of the human body models a conspicuous bilaterality which might be, not unreasonably, extended to minds. There are, after all, two ears, eyes, arms, legs, lungs, and kidneys. And the human brain itself is anatomically and functionally bilateral. Moreover,

since the 1860s, when Broca noticed that regionalized lesions in the left cerebral cortex produced a speech disorder, there has been continuing research to show that the human brain is at least bilaterally asymmetrical; that is, hemispherically and differentially organized.

Such texts are, however, liable to a countervailing body of equally established prima facie evidence, e. g., on the basis of everyday observation of others, or introspection, there is no apparent motivation to attribute either two minds, or one divided mind to a single human individual. That is, in the routine and ordinary conduct of human affairs, we are not inclined to attribute two minds either to ourselves or others. The ordinary speech remark, "I am of two minds about x," portrays just two balanced corpuses of competing evidence rather than two minds containing different corpuses of evidence. Also mitigating against brain-based composition pedagogies is the experimental reliance of the usually-cited neurological studies on abnormal subject pools. Accordingly, none of the prima facie evidence, whether tending to favor or disfavor brain-based composition pedagogies, seems decisive. Observed behaviors and anatomical features are routinely discovered, under scrutiny, to belie physiological and cognitive processes and scientific progress often vindicates surprising preliminary indications.

The enthusiasm for brains follows, in large part, from Sperry's

neurological investigations beginning in the 1950s. Sperry's work has been construed to constitute evidence against the standard belief that a human being is a single, unified agent. Sperry, Bogen and Vogel studied subjects who, usually for relief from severe and intractable epilepsy, had commissurotomies, a surgical procedure which involves sectioning the major neural commissures linking the two cerebral hemisperes (Sperry, "Hemispere Deconnection" 723-24). The perceptual anomalies elicited from such split-brain subjects serve to motivate a two-brain claim which, in turn, motivates several mind propositions. The initial split-brain research has been succeeded by dichotic listening and olfactory studies, amobarbital sodium injection experiments which locally anesthetize regions of the brain, corpus callosum agenisis investigations, and a variety of other hemispheric asymmetry, or dominance, studies However, Sperry's work may be taken as paradigmatic.

The claims generated by studies of split-brain subjects are not altogether surprising given their curious responses to seemingly ordinary puzzles. In the seminal studies of the 1950s, split-brain subjects, presented with the words "key" and "case" in their respective left and right visual fields, verbally reported having seen only the visual stimulus flashed on the right half of a screen, "case," and denied having seen the visual stimulus flashed in the left visual field, "key." At the same time,

the split-brain subject's left hand correctly retrieved an actual key. Consequently, there appeared to be a key-seeing person and a case-seeing person (Sperry, "Hemispere Deconnection" 725-26). Since the surgical procedure itself seems unlikely to have introduced a new cognitive agent, it may not be altogether unmotivated to allege that both persons were present before the operation, that is, in the individual with commissures intact.

Marks identifies several propositions about minds recurring in the literature: the single split-brain subject contains variously (1) two streams of consciousness, (2) two minds, or (3) two persons. The three propositions do not, of course, compose a deductive sequence, but, rather, an ordering, from conservative to radical, of explanations for seemingly aberrant behaviors among subjects exhibiting the split-brain syndrome. A fourth and the most controversial proposition has it that (4) human beings with commissures intact have two minds, are two persons, and comprise two subjects of experience (7). Marks has offered compelling arguments against propositions (1), (2), (3) and (4). Our case which cautions against the premature or even likely applications of split-brain and hemispheric specialization research needs only a much weaker argument: that there are no grounds at this time to undertake or anticipate grand-scale revisions of programs and methodologies in the language arts, revisions that adopt the

most radical proposition, (4), and assume that normal students in the classroom conceal two subjects of experience in a single body.

The current revisions, actual and expected, in the pedagogical literature seem unfounded on one or more of several grounds:

(1) The instructional programs derived from neurological studies ignore the peculiar experimental conditions necessary to produce the anomolous behaviors reported in the relevant literature. This seems to us an even more serious problem for derivative teaching methodologies than the customary objections citing non-generalizable subject pools. With advances in non-invasive neurological measuring devices, the subject pools are likely to grow in numbers and normality. However, the artificially-constrained tasks set in estimating neurological functioning strongly qualifies their application to other, even related tasks, especially complicated ones like writing. The key-case experiment, for instance, inhibits the subject from scanning the presented stimulus by flashing the data for 1/10th of a second. Scanning must be prevented since scanning presents nearly the same data to both eyes and, consequently, both cerebral hemispheres. Scanning is, of course, just what normal humans do in the process of looking. So, given two eyes, each of us is very often two subjects of experience by just some fraction of a second. But, again, neither on grounds of observing others nor on introspection is this

phenomenon detectable. Given the natural process of scanning, which quickly corrects a momentary perceptual discrepancy, there is no obvious reason to posit a psychological dualism. As Wittgenstein has neatly noticed, just because something has only three legs and wobbles doesn't mean that it isn't a table. Significantly, even persons born without a corpus callosum are not obviously detectable from the general population (Saul and Sperry).

(2) Even the more recent cerebral hemisphere studies which seek to distinguish the capacities of the hemispheres do not warrant axiomatic conclusions about dichotomous brains or minds. For example, left hemisphere dominance for language production is far from a settled issue. Springer and Deutsch, in their influential Left Brain/Right Brain, report evidence from amobarbital sodium experiments at the Montreal Neurological Institute of frequent disparities from the usual view, especially but not exclusively involving left-handers (113). Springer and Deutsch also cite research by Lassen and Ingvar that shows increased blood flow patterns in both hemispheres during speech (94). What is becoming increasingly apparent is that language production is a complicated affair involving multiple task-specific cognitive skills and cerebral regions located variously in the brain. Presumably, writing consists in language production in association with still other cognitive

and motor skills. Further evidence, confounding conclusions about highly lateralized hemisperic specialization in the performance of cognitive tasks other than speech, alleges individual differences among tested subjects (e. g., Gur and Reivich 80-84). The portrait emerging from still other neurological studies shows "islands" of cognitive capacities in only relatively fixed anatomical positions and acting strategically to produce given behaviors.

(3) The classroom teacher who professes to teach individual students on the basis of hemispheric dominance is, contrary to the implied claim, proceding on just behavioral evidence. Certainly, many relevant neurological studies rely on observable behaviors, but they are frequently confirmed, or disconfirmed, by anatomical and physiological findings. Classrooms are not equipped for systematic investigations of behaviors, anatomy, or physiology; so, the classroom teacher procedes solely on gross behavioral indications. In any case, the pedagogically relevant line of inquiry has to do with how minds work. Behaviorism, even in modified forms which admit a mind at all, lacks the capacity to investigate states of the mind which are not behaviorally expressed, say, unconscious mental states. At the present time, students are not available for a study of internal, informational states and, in lieu of a sufficiently complete mind to brain mapping, hasty decisions regarding individual students are

probably best avoided.

(4) Even though a good deal is known about intra-brain specialization for language production, language production, an independently complicated performance, is not writing. We suspect that many of the cooptive tendencies of brain-based composition pedagogies stem from exaggerating the role of native language performance in writing. Spoken language is a naturally acquired and universal competence among humans. Children, excepting only those with severe neurological dysfunctions of a relevant nature, usually acquire a native language between twenty months and five years of age. They are able, at a relatively early stage in the language learning process, not only to mimic sentences they hear, but to produce and understand a potentially infinite number of novel sentences without coincidentally acknowledging the innovative character of these sentences. This achievement occurs without formal instruction, with often degenerate input, and without obvious or prolonged periods of deliberation. The acquisition of writing skills appears to follow a very different pattern. Writing skills, in cultures that do write, are acquired via formal instruction exhibiting an order beginning with simple and proceding toward more difficult problems, repetition and coaching, carefully calculated presentations, reinforcement, testing, and so on. Even if some native language-like predisposition for writng was part of human genetic

coding, writing involves integrating a complex set of preexisting cognitive and motor skills. So, writing is not a first-order human activity and stands on even weaker ground than, say, a right-brained approach to teaching oratorical skills.

The perhaps unhappy outcome of our cautionary argument is that, despite the often unsatisfactory results of our acknowledged haphazard classroom labors, there is no pedagogically useful relationship between minds and brains. However, some relief appears on noticing that there are striking reasons to believe that our current haphazard methods are not all that haphazard. On our view, the mind is less a thing than a notion with a certain explanatory power. We all operate, and teach, on rough and ready theories about human beings, e.g., deprived of food, a human being is likely to seek food, and coaching students on punctuation will often improve performance. Certainly, our rough theories sometimes fail and are not suitably predictive. Perhaps neurological studies will radically alter our views about human beings. But, for the present and the foreseeable future, there is no compelling reason to abandon our current lines of thinking or teaching.

Consequently, despite the remarkable neurological advances made over the past four decades, we as humans and teachers are best guided by our imperfect but workable theory about humans based on a long

accumulation of folk wisdom. The theory makes reference to internal states, mental events. A mind is no more than a conceptual collection of the mental states housed together as an apparently unified entity.[2] And it is these very unified entities that we meet in the classroom, armed with our common sense theory, endorsed by its relative simplicity and durability, and arguably not disputed by contemporary neurology. Thus, for us as teachers, there is no compelling reason to adopt any views whatsoever in the matter of unity or disunity of consciousness. Humans may or may not be single, unified agents but they seem so.

Given just this, we repudiate pedagogical strategies which urge instruction of asymmetrical minds on grounds of asymmetrical brains. At least many of pedagogies which seem to imply a scientific claim by virtue of some attachment to Sperry's brilliant work are exaggerated responses or premature applications.

Notes

[1] Such mutual interests are not, of course, altogether unsanctioned. For instance, Bogen, an early colleague of Sperry, has speculated broadly on the nature of minds adduced from his neurological investigations ("The Other Side of the Brain II: An Appositional Mind" and "The Other Side of the Brain III: The Corpus Callosum and Creativity"). The pressures to extrapolate general explanations from relatively esoteric data are considerable and occur in response to frustrations in figuring out humans.

[2] Our folk wisdom view of the human mind is, not surprisingly, an apt and durable view responsive to an impressive variety of human interests and investigative pressures. At least so far, neurologists have tended to confirm our common sense theories which, usefully, make reference to internal states, mental events. Minds are the entities which carry these internal states. Moreover, our common sense theory about human minds has some strikingly advantageous provisions: namely, (a) no preoccupation with deciding between conscious and unconscious mental states, (b) agnosticism regarding whether or not inorganic materials have minds and, indeed, whether or not there are minds at all, (c) incompatibility with behaviorism, and (d) neutrality in the debate between rationalists and empiricists.

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